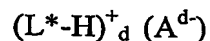


## Claims:

1. A method for the preparation of a supported transition metal catalyst system said method comprising the steps of:
  - (i) mixing together in a suitable solvent
    - (a) an organometallic compound, and
    - (b) an ionic activator comprising a cation and an anion,
  - (ii) addition of the mixture from step (i) to a support material, and
  - (iii) addition of a transition metal compound in a suitable solvent, *characterised* in that the molar ratio of organometallic compound (a) to ionic activator (b) in step (i) is in the range 0.1 to 2.0.
2. A method according to claim 1 wherein the molar ratio of organometallic compound (a) to ionic activator (b) is in the range 0.3 to 0.6.
3. A method according to either of the preceding claims wherein the organometallic compound comprises a Group IIIB metal.
4. A method according to claim 3 wherein the organometallic compound is an organoaluminium compound.
5. A method according to claim 4 wherein the organoaluminium compound is triisobutylaluminium.
6. A method according to any of the preceding claims wherein the ionic activator has the formula:



wherein

$L^*$  is a neutral Lewis base

$(L^*-H)^+_d$  is a Bronsted acid

$A^{d-}$  is a non-coordinating compatible anion having a charge of  $d^-$ , and

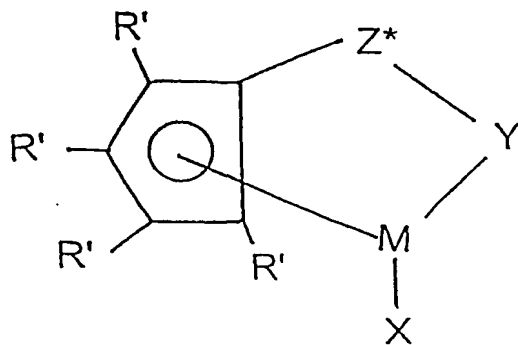
$d$  is an integer from 1 to 3.

7. A method according to claim 6 wherein the ionic activator comprises a cation and an anion wherein the anion has at least one substituent comprising a moiety having an active hydrogen.
8. A method according to any of the preceding claims wherein the transition metal compound is a metallocene.
9. A method according to claim 8 wherein the metallocene has the formula:



wherein Cp is a single cyclopentadienyl or substituted cyclopentadienyl group optionally covalently bonded to M through a substituent, M is a Group VIA metal bound in a  $\eta^5$  bonding mode to the cyclopentadienyl or substituted cyclopentadienyl group, X each occurrence is hydride or a moiety selected from the group consisting of halo, alkyl, aryl, aryloxy, alkoxy, alkoxyalkyl, amidoalkyl, siloxyalkyl etc. having up to 20 non-hydrogen atoms and neutral Lewis base ligands having up to 20 non-hydrogen atoms or optionally one X together with Cp forms a metallocycle with M and  $n$  is dependent upon the valency of the metal.

- 10 A method according to claim 8 wherein the metallocene is represented by the general formula:



wherein:-

R' each occurrence is independently selected from hydrogen, hydrocarbyl, silyl, germyl, halo, cyano, and combinations thereof, said R' having up to 20 nonhydrogen atoms, and optionally, two R' groups (where R' is not hydrogen, halo or cyano) together form a divalent derivative thereof connected to adjacent positions of the cyclopentadienyl ring to form a fused ring structure;

X is a neutral  $\eta^4$  bonded diene group having up to 30 non-hydrogen atoms, which forms a  $\pi$ -complex with M;

Y is -O-, -S-, -NR\*-, -PR\*-,

M is titanium or zirconium in the + 2 formal oxidation state;

Z\* is SiR\*<sub>2</sub>, CR\*<sub>2</sub>, SiR\*<sub>2</sub>SIR\*<sub>2</sub>, CR\*<sub>2</sub>CR\*<sub>2</sub>, CR\*=CR\*, CR\*<sub>2</sub>SIR\*<sub>2</sub>, or GeR\*<sub>2</sub>, wherein:

R\* each occurrence is independently hydrogen, or a member selected from hydrocarbyl, silyl, halogenated alkyl, halogenated aryl, and combinations thereof, said

R\* having up to 10 non-hydrogen atoms, and optionally, two R\* groups from Z\* (when R\* is not hydrogen), or an R\* group from Z\* and an R\* group from Y form a ring system.

11. A method according to any of the preceding claims wherein the support material is silica.
12. A method according to claim 11 wherein the silica is pretreated with an organometallic compound.
13. A method for the preparation of a supported transition metal catalyst system said method comprising the steps of:
  - (i) mixing together in a suitable solvent
    - (a) an organometallic compound, and
    - (b) an ionic activator comprising a cation and an anion,
  - (ii) addition of the mixture from step (i) to a support material, and
  - (iii) addition of a transition metal compound in a suitable solvent

*characterised* in that the molar ratio of organometallic compound (a) to ionic activator (b) in step (i) is in the range 0.1 to 2.0 and wherein after step (iii) there are no washing steps performed before the solvent is removed.
14. A process for the polymerisation of olefin monomers selected from (a) ethylene, (b) propylene (c) mixtures of ethylene and propylene and (d) mixtures of (a), (b) or (c)

with one or more other alpha-olefins, said process performed in the presence of a supported transition metal catalyst system prepared according to the method of any of the preceding claims.

15. A process for the polymerisation of ethylene or the copolymerisation of ethylene and  $\alpha$ -olefins having from 3 to 10 carbon atoms, said process performed under polymerisation conditions in the presence of a supported catalyst system prepared according to the method of any of claims 1-13.

16. A process according to claim 15 wherein the  $\alpha$ -olefin is 1-butene, 1-hexene, 4-methyl-1-pentene or 1-octene.

17. A process according to any of claims 14 to 16 performed in the solution, slurry or gas phase.

18. A process according to any of claims 14 to 16 performed in a fluidized bed gas phase reactor.